

Proposed Amendments to and New Requirements for On-Board Diagnostics II (OBD II)

September 25, 2015



Today's Presentation

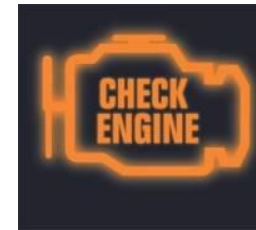
OBD II Regulatory Update

- Background
- Proposed Amendments and New Requirements
- Summary

Background

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- On-Board Diagnostic (OBD) systems
 - Detect emission-control system problems
 - Reduce in-use emissions through faster identification/repair of problems
- How do they work?
 - Mostly software in engine computer
 - Illuminates 'check engine light' when fault is detected
 - Standardized information for repair technician to help fix vehicle



Benefits of OBD to Consumers

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- Identifies emission-related components covered under warranty
 - Eliminates unnecessary repairs
 - Fault codes and other scan tool data give information about area of malfunction or a specific component
- Consumer protection
 - Durability incentivized by cost of warranty repairs / customer satisfaction
- Early Detection of Malfunctions
 - Prevent secondary malfunctions (e.g., detect misfire before catalyst damaged)

OBD: Where We Are Today

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- OBD on vehicles since 1996
- 150+ million OBD II vehicles on the road in the US
- OBD II systems are used as basis for emission inspection programs throughout U.S.
- OBD-based Smog Check has been shown to be more effective and less expensive than traditional tailpipe testing or other inspection methods



Reason for Changes

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- Amendments needed to address LEV III emission standards
 - OBD helps ensure emission reductions from LEV III program
- Program updates occur regularly
 - Technology forcing regulation
 - Periodic reviews to check progress
- Changes affect light- and medium-duty vehicles

LEV III Emission Malfunction Thresholds

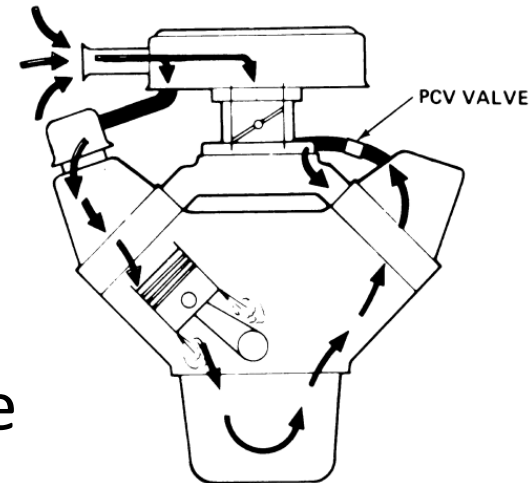
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- LEV III differs from LEV II
 - Combined NMOG and NOx tailpipe standards
 - New lower vehicle emission categories (ULEV70, ULEV50, SULEV20)
 - Lower PM tailpipe standards
- Proposal
 - Thresholds for combined NMOG+NOx standards
 - Thresholds for new lower emission categories

More Stringent Requirements

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- Proposed changes to crankcase ventilation (CV) system monitoring requirements
 - Improved monitoring of hose failures in CV system from 2023MY for gasoline and 2025MY for diesel
- Proposed addition of evaporative system leak monitor testing
 - Align with U.S. EPA's Tier 3 requirements for certification and in-use programs



Changes to Streamline OBD

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- Address OBD implementation in light of Advanced Clean Car program
 - Vehicle design and emission controls more complex -emission control more heavily integrated with powertrain
 - Better defining limits of OBD requirement applicability improves clean vehicle implementation process
- Amendments proposed to exempt components with little or no emission benefit and to assist in OBD certification



Standardized Data

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- Standardized data has always been integral to OBD
 - Ensures access to repair emission-related faults
- Current data also supports other ARB needs:
 - Smog Check inspections
 - OBD certification and compliance testing
 - Tailpipe certification and emission compliance testing
- Today's proposal contains added data for these purposes
 - Would also include GHG data for the first time

Data for Real-World Emissions Evaluations

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- Investigation of differences between real-world and test-cycle performance
 - Verify emission benefits achieved in-use
- National Academy of Sciences highlighted importance of understanding real-world GHG emissions in 2015 report
 - Critical to determine actual benefits and for consideration when establishing future standards



NATIONAL ACADEMY OF SCIENCES

Proposal Specific to Plug-in Hybrids



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- Data to quantify real world usage
 - Report total gasoline and electricity used and miles traveled
- Verify current and future regulations properly account for emissions

Proposal for “Off-cycle” Technologies



- Current GHG standards grant credits for technologies with additional benefits in-use
- Data would help quantify and validate these benefits
 - Report cumulative time technology is activated and/or how often it achieves the desired result



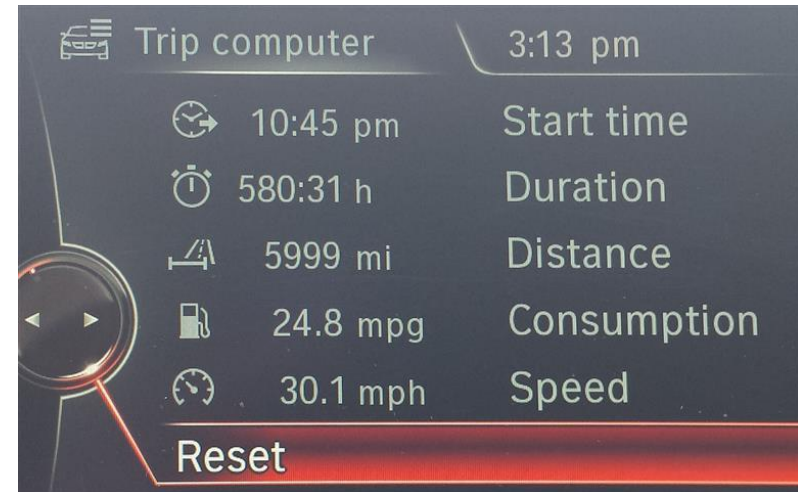


Proposal for All Vehicles

Data to evaluate real-world GHG/fuel economy

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Proposed Data Parameter	Example Data
Total distance traveled	25,388 miles
Total fuel consumed	738.3 gallons
Total vehicle / engine run time	887.7 / 842.4 hours
Total vehicle / engine idle time	148.1 / 112.4 hours
Total city / highway drive time	485.1 / 254.5 hours
Total Positive Kinetic Energy (PKE)	9,278,842.8 m/sec ²
Total Engine Torque (work)	3,409,091.4 Newton-meters



Addressing Concerns

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- Concern #1: Data identifies driver habits

Response:

- Content minimized and stored in aggregate only
- Purposefully structured to only quantify vehicle (not driver) GHG performance
- No location or personally identifiable information

Addressing Concerns (cont.)

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- Concern #2: Data transmitted or obtained without permission

Response:

- Access to data requires physical connection and vehicle owner permission
- ARB will only collect data from voluntary participants

Addressing Concerns (cont.)

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- Concern #3: Data can be stolen or misused

Response:

- No new access point to vehicle created
- Proposed data often already on cars (fuel economy displays)
- Data collected by ARB will be stored without specific vehicle VIN

Costs

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- Minimal impacts to cost
 - \$5.11/vehicle to vehicle manufacturer
 - \$5.43/vehicle to consumer (<0.02% of retail price)
- Preserves benefits of LEV III program

Summary

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- Proposed changes necessary to ensure successful OBD II and LEV III program
 - Balance of changes to streamline certification and strengthen the program
- Staff recommends adoption of amendments with 15-day changes
 - Technical clarifications, do not affect stringency